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ABSTRACT

This primer is designed to teach about the concept of census tracts. Census tracts are relatively small statistical subdivisons that vary in population from about 2,500 to 8,000 and are designed to include fairly homogeneous populations. They are most often found in cities and counties of metropolitan areas of the nation. In all, there are over 43,300 census tracts (according to the 1980 Census). Product primers are prepared primarily for college-level instructors, but can also be used for self-study. This primer includes background information, exercises designed to teach census concepts and data use skills, a presentation outline, and exercise answer keys. (DB)

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CENSUS TRACTS (PHC80-2)

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CENSUS '80 Product Primers

Primer Number 10

CENSUS TRACTS (PHC80-2)

Issued August 1984

Imagine this situation: You are sitting at your desk when the director of marketing bursts through the door. "I need a quick analysis of the market for our new product. Try Wichita!" he says in a staccato voice, whirling on his heels and exiting into the hall.

The question implied in the director's request is "How many people are likely to buy the new product?" You could answer this request using summary data for the entire area or you could be more precise if you used the Census Tract report and accompanying map set (see figures 1 and 3) for the Wichita SMSA. Census tract reports contain a broad range of data and are useful tools for demographic analysis. The specific characteristics of those persons most likely to buy this or any product are subjects for market researchers to study. You will find many of these characteristics tabulated in the Census Tract reports.

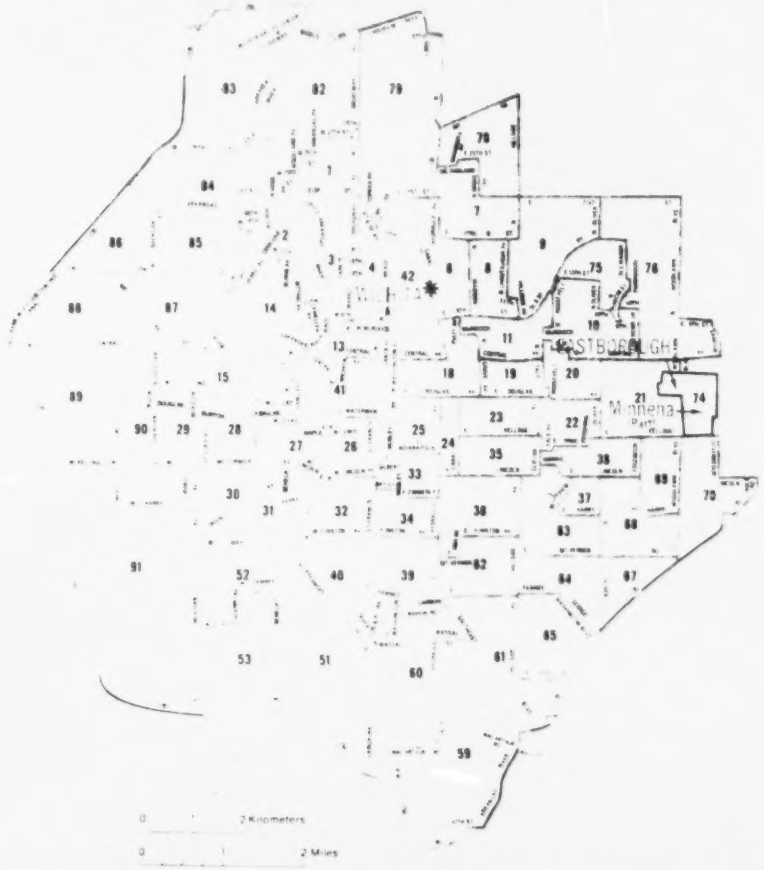
Census tracts are relatively small statistical subdivisions that vary in population from about 2,500 to 8,000 and are designed to include fairly homogeneous populations. They are most often found in cities and in counties of metropolitan areas i.e., the more densely settled portions of the nation. In addition, about 3,000 census tracts were established in 221 nonmetropolitan counties, along with five States that were entirely tracted: Connecticut, Delaware, Hawaii, New Jersey, and Rhode Island. In all, there are over 43,300 census tracts.

Local Census Statistical Areas Committees establish census tracts in cooperation with the Census Bureau. With time, of course, areas change in demographic makeup as people move in and out. Census tracts with high growth may need to be divided into two or more tracts, and those experiencing decline may have to be merged with neighbor tracts. In such cases, the boundaries of the original tracts remain intact, permitting statistical comparison over time.

Census Tract reports are issued for all SMSA's and tracted balances of States. They are available from the U.S. Government Printing Office (GPO) for $4.00 to $23.00 per area. GPO sells separately the map sheets ($4.00 to $8.00) you need to use with these reports.

Product Primers are prepared primarily for college-level instructors. They can also be used for self-study. This Primer includes background information (page 1), exercises designed to teach census concepts and data use skills (pages 2 to 7), a presentation outline (page 8), and exercise answer keys (page 8).

Figure 1. **Census Tract Map Insert for Wichita, Kansas**



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EXERCISE 1. WHAT'S THE POPULATION?

There are as many as six different population totals for each tract in a census tract report. You may not know which number to use unless you can read a census tract map and table. This exercise uses 1980 data for Wichita, Kansas to illustrate this point.

1. Census tract maps identify boundaries of tracts and political jurisdictions (places, counties). As seen in figure 2, both types of boundaries have different symbols. On occasion these boundaries overlap. Which of the tracts shown in figure 1 (page 1) have political boundaries (subdivision or place) that overlap a tract boundary?

2. Figure 3 shows a portion of the metropolitan area that is south of the area shown in figure 1. Name the eight physical boundaries (streets, highways, rivers, etc.) that encompass tracts 54, 55, 56, and 57.

3. Tabulations for incorporated places of less than 10,000 (e.g., Haysville) are not included separately in the census tract publication. What tract includes most of Haysville? Where does its boundary coincide with the tract boundary?

4. Census tract data are easy to find if they are within an incorporated place of 10,000 because tracts are numbered consecutively within each place and, in the case of split tracts, the data are shown for the portion of the tract that is within the city limits. Figure 4, however, displays the organization of the census tract report for the four tracts shown in figure 3. Tract 54, as an example, has a total population of 4,874 (4,342 + 532) yet the tract tabulations for Wichita city show the total population to be 4,342. A small superscript "p" is the only feature in the tables that distinguishes tracts that are split (e.g., 0054^{p}) from those that are whole (e.g., 0057). The next section of the tract table (remainder for Sedgwick County) lists the tracts outside the corporate boundary. Here again the superscript "p" identifies the split tracts. If you need data for the total population of the entire tract, check the last section of the table (totals for split tracts in Sedgwick County). There you will find the tabulations for those tracts split by political boundaries.

5. Use the population totals written on the map to complete figure 4. Which three of the eight numbers you recorded show a possible population total for tract 54?

6. The population counts you wrote in figure 4 came from table 1 of the Wichita tract report, one of several tables with complete-count data. Other tables (P-9 to 21) show data that came from the sample portion of the population questionnaire. As an example, the last line of figure 4 shows the population counts as found in table 9 of the Wichita tract report. Because sample data must be weighted to arrive at estimates close to the total count, the Census Bureau uses sample weighting areas (SWA's). SWA's are mutually exclusive units that observe county, place, tract, or minor civil division boundaries provided that such areas have at least 2,400 inhabitants. Census statisticians combine tracts having less than 2,400 population with the next census tract to make up a SWA, with the result that complete-count and sample totals may not match exactly for either tract but should match if added together. Does the count of total persons in tract 56 (Wichita city portion) from table 1 match that from table 9? Tract 56 was combined with 57 to form a SWA because the former lacked the 2,400 threshold number. Does the combined population of tract 56 and 57 within Wichita city for table 1 match that found in table 9?

7. Now you understand that the confusion in tract totals is a result of split tracts and SWA's. Suppose you want to know the percentage of persons 65 years or over for tract 56 (you have six different population totals from which to choose). Develop a set of rules to ensure that you select the appropriate denominator to solve this problem.

Figure 2. **Selected Census Tract Map Symbols**

SYMBOLS	TYPE STYLES	GEOGRAPHIC AREAS
		Census tract
	BLACKBURN ST	Census tract boundary identifier
	10 10 10	Census tract number
		Inset area
— — —	Locust	County subdivision
———	SILAS	Incorporated place
~~	*Lake Wingra*	Major water features

Figure 3. **Selected Wichita Tracts**

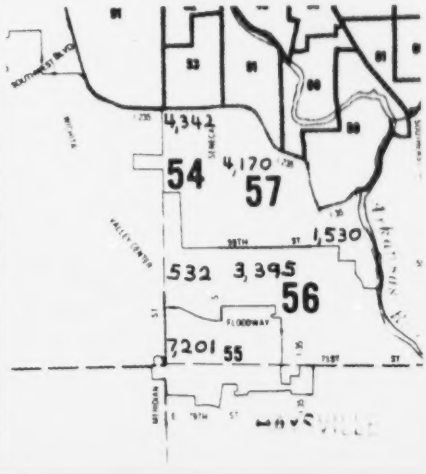

Figure 4. **Total Population for Selected Tracts**

	Wichita city, Sedgwick County			Remainder of Sedgwick County			Totals for split tracts in Sedgwick County	
Census Tracts	Tract 0054^{p}	Tract 0056^{p}	Tract 0057	Tract 0054^{p}	Tract 0055	Tract 0056^{p}	Tract 0054	Tract 0056
Table P-1.	___	___	___	___	___	___	___	___
Table P-9.	4 342	1 554	4 146	563	7 193	3 296	4 905	4 850

EXERCISE 2. MATCHING QUALITATIVE AND QUANTITATIVE DATA

Researchers are discovering anew that statistical graphics can improve their understanding of the world. This exercise uses written narratives, topographic maps, and statistical graphics to enhance your understanding of census tract data.

1. The data in statistical tables have many stories to tell. Your task is to use all of the information provided on the next few pages to match the graphs with the census tracts they represent. First, locate and circle the following tracts on figure 1: 1, 6, 14, 41, 65, 74, and 86. These tracts were chosen because each presents a unique perspective on the Wichita story.

2. The U.S. Geological Survey produces topographic maps to highlight cultural features (e.g., streets, parks, schools), and physical features (e.g., rivers, elevation). Match the topographic maps (figure 7) with the seven tracts in figure 1. Which cultural and physical features might help you figure out which socioeconomic groups live in these tracts?

3. Read the profile presented in figure 5. It presents a short historical sketch of the city and offers insights into some of its social and economic characteristics. Use the maps in figures 1 and 7 to locate the areas cited.

4. Study the graphs shown in figures 8 to 13 to gain further insights about Wichita. If you need help in interpreting these graphics, use the information in figure 6. Match tracts A to G with the ones you circled in figure 1. Take your time because you have a lot of information to digest.

5. If you are satisfied with your matches, check your answers against those offered on page 8.

6. Now, review what you have learned. Which tracts in your city resemble those you have just studied. Test your assumptions with tract data from your area.

Figure 5. Wichita—a profile

Wichita has grown from a prairie settlement to become the "air capital of the world." Pioneers stopped at this settlement at the fork of two Arkansas River branches to replenish their wagons for the long journey across the prairie. Later, it earned the "cowtown" image because cattle were driven hundreds of miles to railroads in Wichita to be shipped to the population centers back east. Recently, it has shaken its dependency upon agriculture. Beechcraft, Cessna, and Boeing have large plants to the east and southeast of the city; Learjet and Cessna have plants to the southwest, and McConnell Air Force Base borders the tracts to the southeast.

Wichita experienced changes in the structure of its residential areas that are typical of many cities. Its well-to-do citizens first chose to live in neighborhoods near the center of the city while laborers chose housing near employment opportunities. The central business district (CBD) is near the first transportation hub; population growth around this hub resembles concentric rings with ring after ring of newer housing surrounding the older areas. Recently, young professionals have been attracted to the condominium and apartment developments in areas of close proximity to the CBD.

With few exceptions, the sectors (wedges) that have high social status are to the east and northwest (highest sector is in east). Much of the industrial activity (other than aircraft), on the other hand, is near the railyards in north Wichita.

Figure 6. Descriptions of Selected Demographic Measures

Household Type and Relationship (figure 8)---Shows the relationship of person(s) in the household (housing unit) to the person (householder) who completed the questionnaire. Tract A had a high percentage of persons in the "other" category. This category identifies those who lived in group quarters (e.g., college dormitories, nursing homes) rather than in households. Note that tract F had the highest proportion of "other relatives" (e.g., children, elderly parents) and a rather low proportion of spouses.

Persons in Housing Unit (figure 9)---Depicts the size of each household. Note that tracts C, E, F, and G had similar characteristics. Less than 30 percent of the housing units in tract A had more than one person--the smallest percentage for any tract in the city. Of the seven tracts, A and B had the highest percentage of one or two person households.

Occupation (figure 10)---The chart shows the type of occupation held by the population aged 16 years and over relative to the Wichita city percentage. As an example, the percentage of persons in service occupations in tract A was far above the Wichita average; the category of operators, fabricators, and laborers was almost identical to that of the city; and technical, sales, and administrative speciality occupations were below the city average. Note that in tracts B, C, and D, the managerial and professional speciality occupations had the highest index value; tracts E, F, and G were just the opposite. Tract A, however, stands in sharp contrast to any of the other tracts.

Age/Sex Pyramids (figure 11)---Shows at a glance the distribution of males and females according to age characteristics. Suburban tracts typically have young families; hence, they have a large base. Tracts near the center of the city typically have more of a top-heavy pyramid.

Spanish origin and Race (figure 12)---A person of Spanish origin could be of any race (e.g., White, Black, Asian and Pacific Islander) in the 1980 census. Thus, 100 percent of the population can be accounted for in the race (right) side of the graph while having, as is the case with tract E, over 30 percent in the Spanish origin (left side) category. Tracts B, C, and D have a rather low percentage of minority populations. This graph, more than any other, illustrates the differences in tracts E, F, and G. Wichita city's minority populations are concentrated in a few tracts: over 60 percent of its Black population lived in six tracts and over 30 percent of its Spanish origin population lived in four tracts.

Year Householder Moved Into Unit (figure 13)---Occupied housing units can be classified as either owner- or renter-occupied. Although the time intervals are not equal (e.g., 1975-78 is a 3-year period and 1979-3/1980 is a 15-month period), the chart illustrates that owners tend to occupy a specific housing unit longer than renters do. Note that most of the housing units in tracts A and G were occupied by renters. Tract D, on the other hand, lacked renter-occupied housing.

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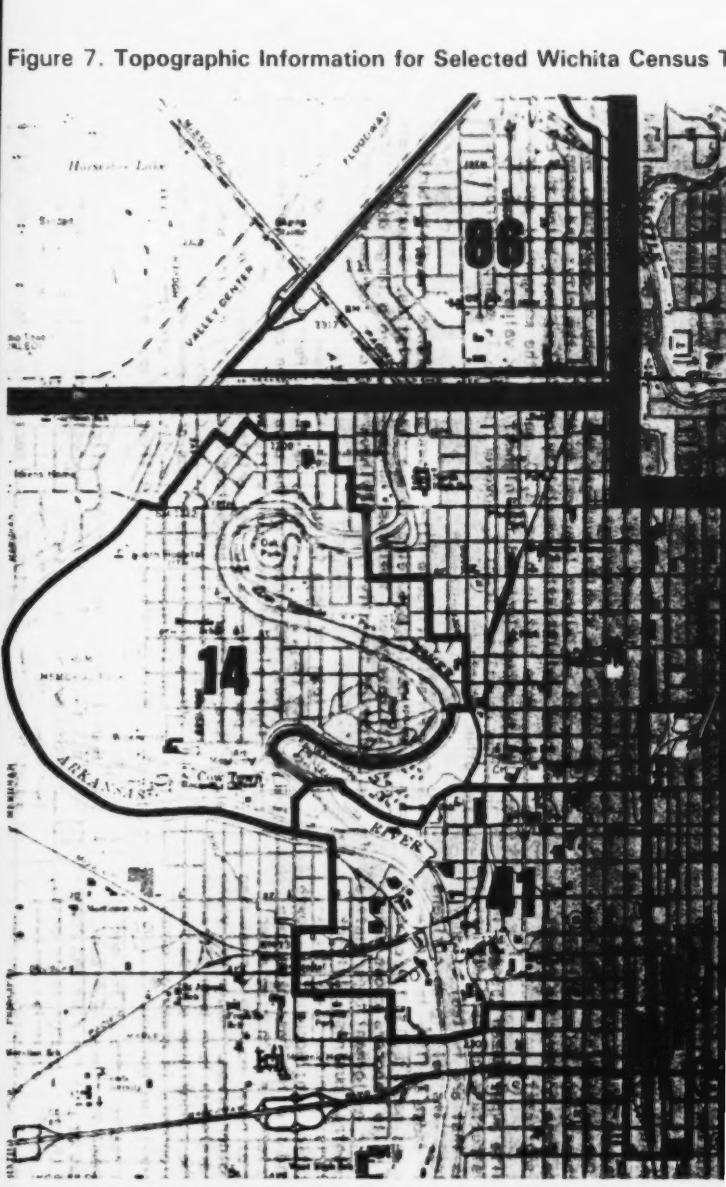
Figure 7. Topographic Information for Selected Wichita Census T



Source: U.S. Geological Survey (Wichita East and Wichita West Quadrangles)

nsus Tracts

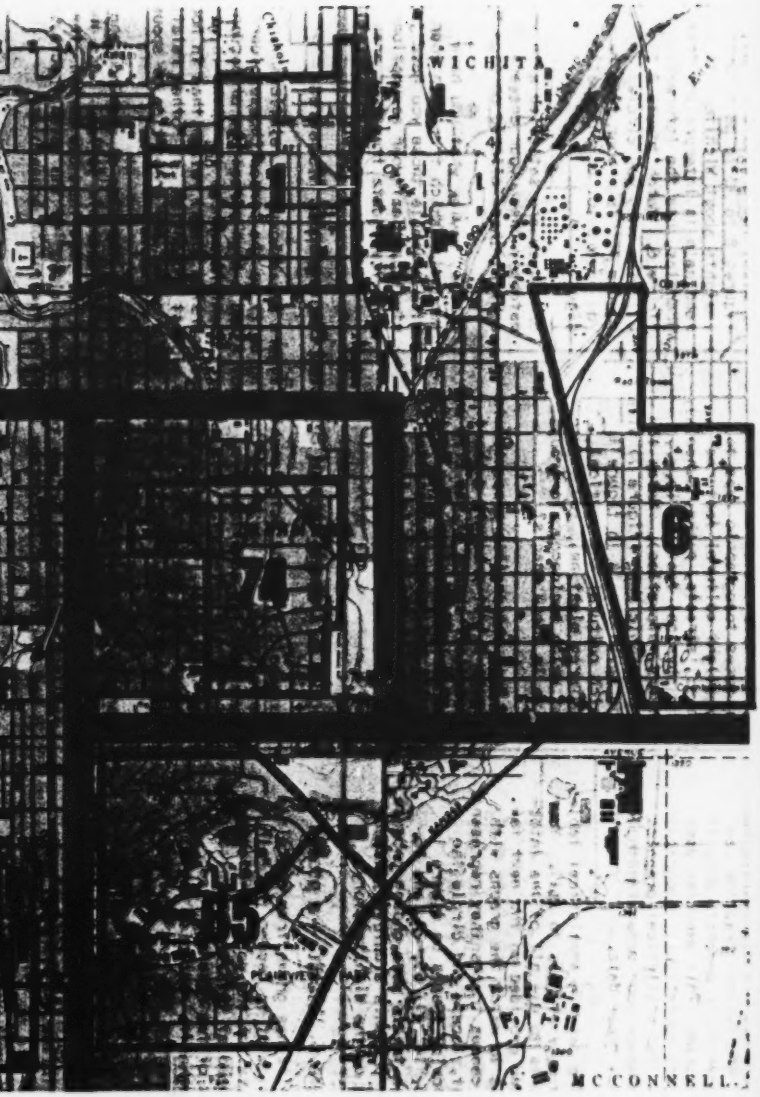


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Figure 8. Household Type and Relationship of Residents

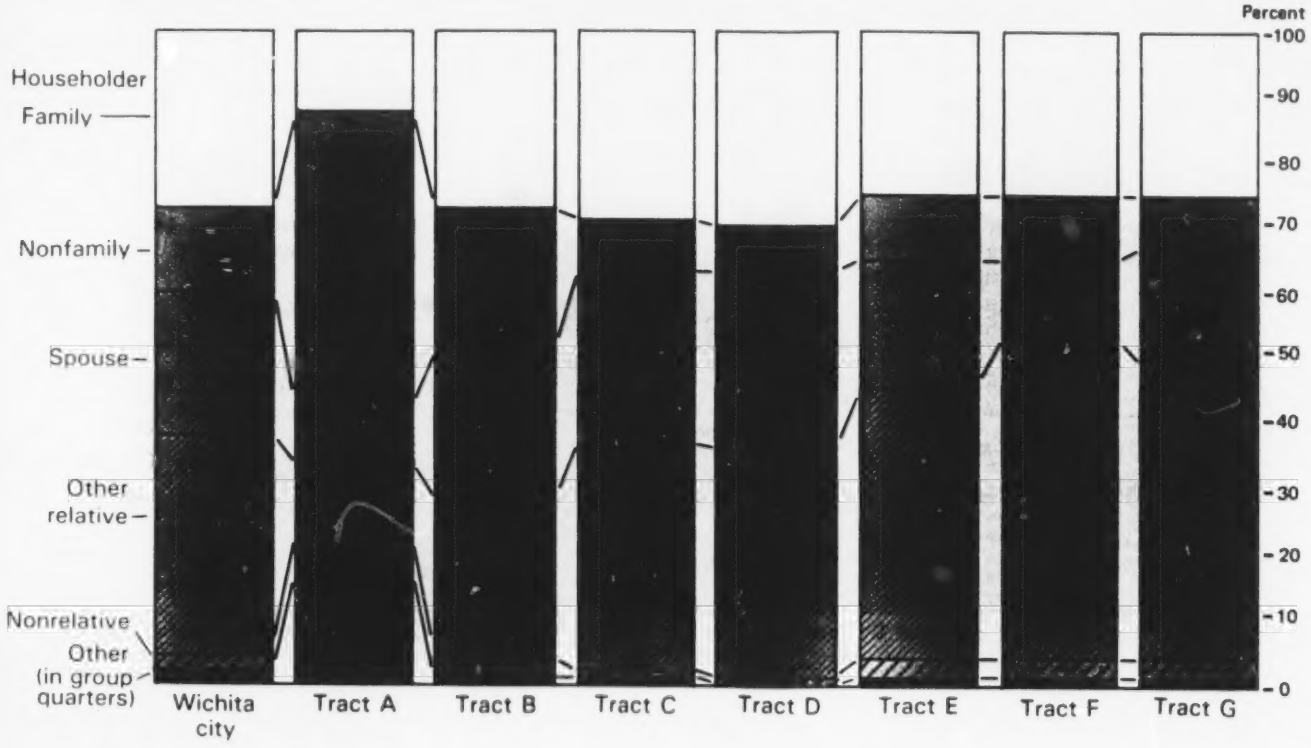


Figure 9. Persons in Housing Unit

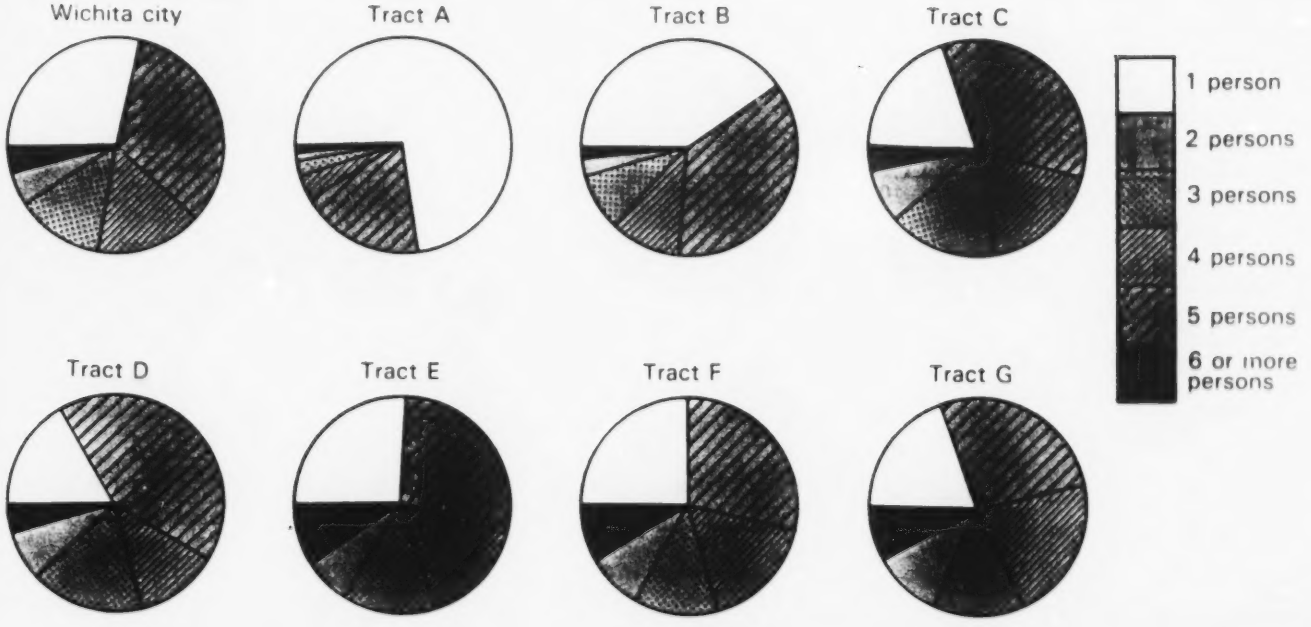


Figure 10. **Occupation of Employed Persons 16 Years and Over**

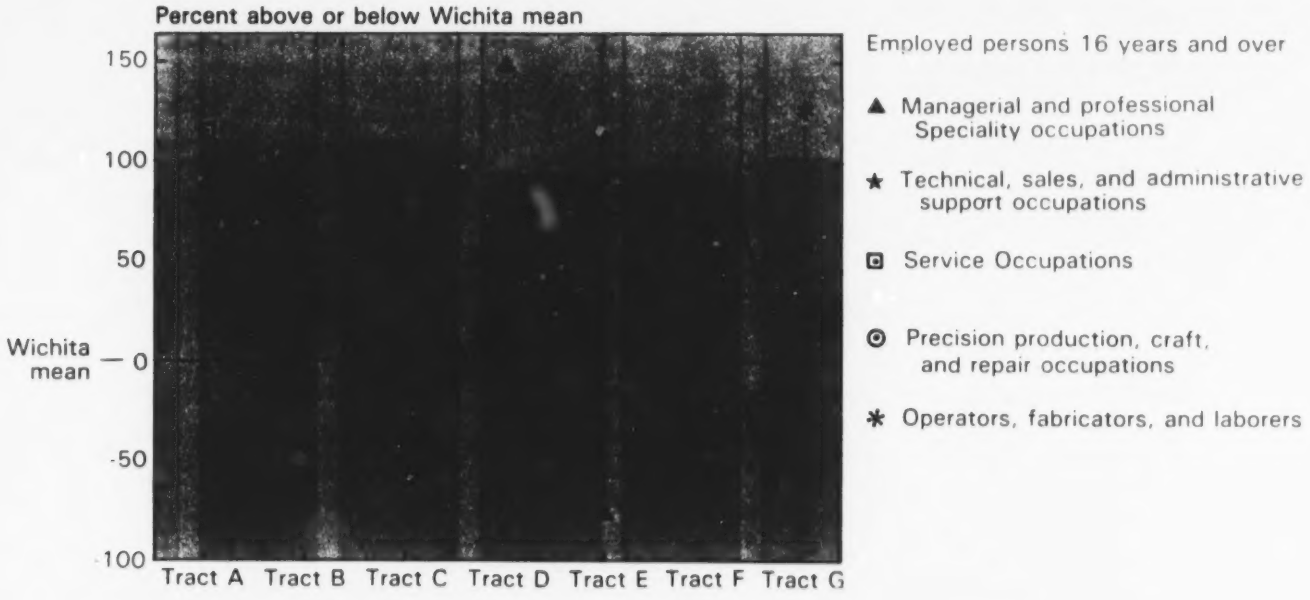


Figure 11. **Age/Sex Pyramids of Residents**

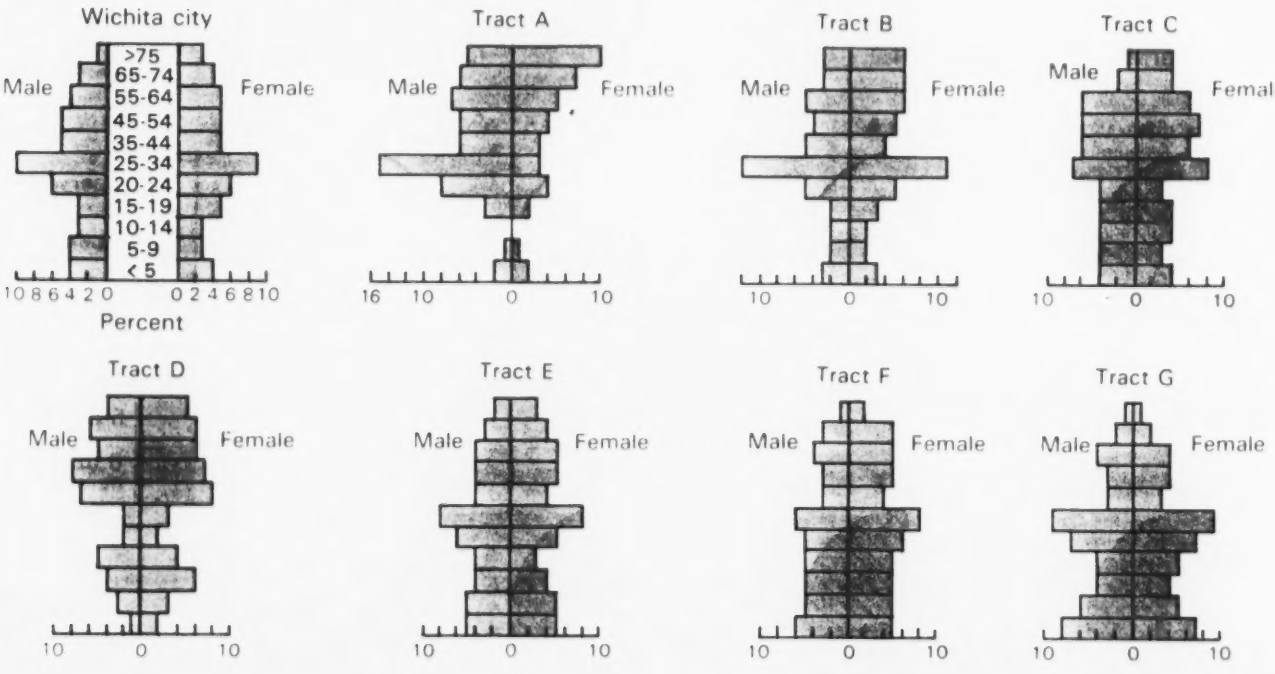


Figure 12. Spanish Origin and Race of Residents

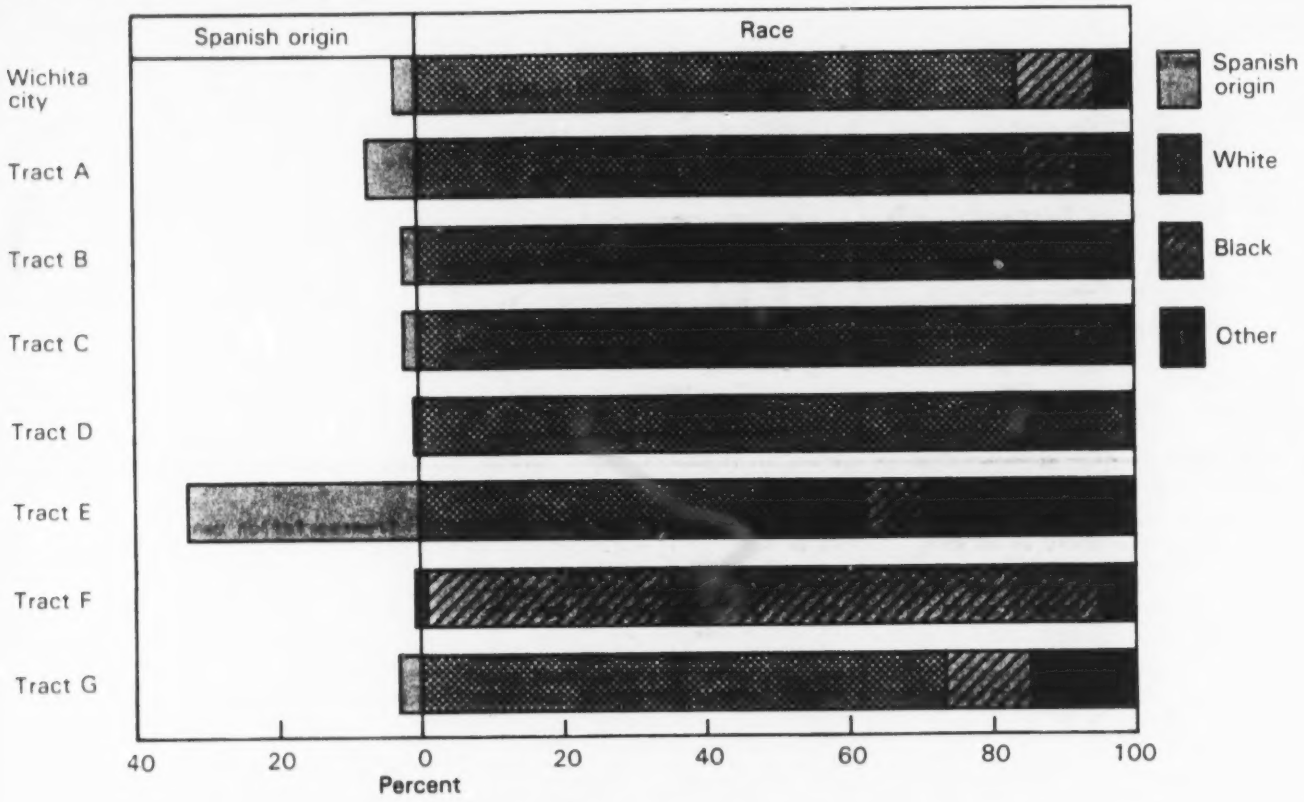
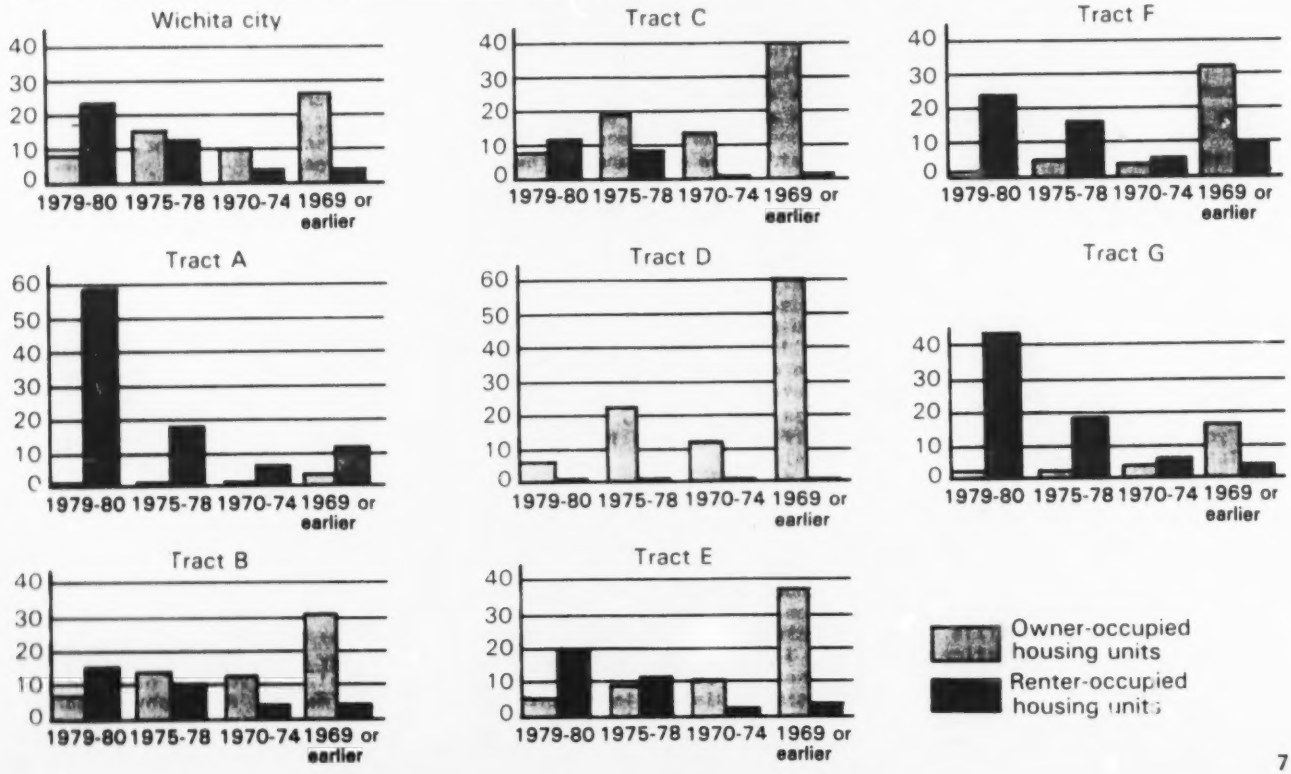


Figure 13. Year Householder Moved Into Housing Unit (in percent)



TECHNICAL NOTES

Census tracts (PHC80-2) offer data for small areas for most of the country's large population settlements.

I. PHC80-2-371 designates:
   A. PHC80- population and housing characteristics from the 1980 census.
   B. 2- second in the series. Others in the series include Block Statistics, Summary Characteristics for Governmental Units and SMSA's, and the Congressional Districts of the 98th Congress.
   C. 371- indicates the report number (Wichita, Kansas). There are 373 reports in the series.
   D. Census tract map package numbers match the tract report numbers.
II. Source
   A. Summary Tape File (STF) 2 generated the complete-count data items in tables P-1 to 7 and H-1 to 6.
   B. STF 4 generated the sample estimate data found in the remaining 26 tables.
III. Geographic coverage
   A. Reports issued for each SMSA.
   B. Areas outside SMSA's that have tracts are covered in State remainder reports.
IV. Features
   A. Nine tables offer data for the entire population of the SMSA, counties, incorporated places, and census designated places as well as for split and whole tracts.
   B. Other tables show data for race and ethnic groups.
V. Uses
   A. Permits time series studies for small areas.
   B. Popular source for small area studies in marketing, planning, and research.
VI. Limitations
   A. Maps must be purchased separately.
   B. Sample estimate data (tables P-8 to 21 and H-7 to 18) subject to sampling variability (see appendix D).
   C. Check comparability tables (A and B) for tract boundary and numbering changes.

ANSWER KEY

Exercise 1 helps students understand why there could be as many as six different counts of population and housing units for what appears to be the same tracted area.

The Census Bureau uses physical features to identify tract boundaries. Political boundaries, however, sometimes split tracts. When this happens, tract reports present data for the portions both inside and outside the jurisdiction, and for the total tract.

Answers to exercise 1 are.
1. Tracts 59, 61, 67, 70, 74, 78, 79, 83, 84, 86, 91.
2. Southwest Blvd., Wichita-Valley Center floodway, Meridian St., 79th St., I-35, 71st St., Arkansas River, and I-235.
3. Tract 55. Meridian St.
4-5.

Wichita City		Remainder		Totals	
54	4,342	54	532	54	4,874
56	1,530	55	7,201	56	4,925
57	4,170	56	3,395		

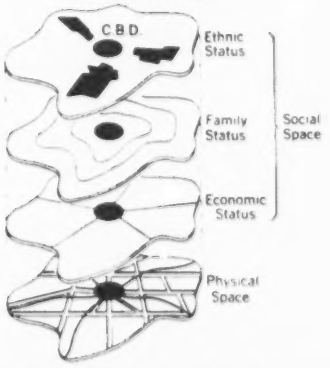
6. No. Yes.
7. Possible rules: 1. Determine if the tract is split; 2. If so, determine for which portion of the tract data are needed; 3. Use the table header to find the area you want to study; 4. Use complete count information whenever possible, and 5. If you use a numerator from the sample estimates to calculate a percentage, select the denominator from the same table.

Exercise 2 offers a challenging opportunity to develop skills needed to interpret statistical graphics, apply census concepts, and use both quantitative and qualitative data to arrive at a decision. Though the task appears to be simple, it requires careful investigation to discover all of the clues imbedded in the exercise. In fact, you may want to eliminate one or two of the tracts from the exercise. Encourage students to share ideas about their interpretation of the data and describe in journalistic terms the characteristics of the tracts. Wichita, Kansas was chosen because it has a spatial structure that matches rather closely what social scientists have found in factorial ecology studies (figure 14). As examples, many Blacks and persons of Spanish origin (ethnic status) live in northern Wichita; few families with children (family status) live near the CBD; and high income sectors (economic status) exist to the east and northwest.

The correct matches are:
A = 41 (Central business district. Like many CBD's, tract 41 attracts persons whose housing needs are minimal and who seldom have children in the household.)
B = 14 (Young professionals have been attracted to this centrally located area due to recent townhouse construction, its old, well-built housing, and its cultural amenities.)
C = 86 (Over 60 percent of the housing units in this middle-class suburb have been built since 1960.)
D = 74 (This one-tract incorporated city, Eastborough, surrounded by the city of Wichita, is one of the most affluent tracts in the SMSA.)
E = 1 (This tract has the highest percentage of Spanish origin population in the SMSA. Its location near industry and transportation centers traditionally acted as an important source for employment.)
F = 6 (This tract has the second highest Black population in the metropolitan area. Over 90 percent of the population was Black in tracts 6, 7, 8, and 42.)
G = 65 (The anomalous characteristics of this tract are partly due to its proximity to McConnell Air Force Base and Boeing Aircraft. Its housing, mostly rental, consists of converted World War II barracks largely constructed in the 1940's.)

Although this activity is self contained, it can serve as a model activity for a person's local area. If you choose this option, select tracts that are divergent in character, age, and location.

Figure 14. Idealized Urban Structure



Source: Murdie. Factorial Ecology of Metropolitan Toronto 1951-61. University of Chicago: Department of Geography Research Series, 1969.

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